Canada

THE ELECTRONICS INDUSTRY IN CANADA — AN OVERVIEW—

Government of Canada
Regional Industrial Expansion

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Expansion industrielle régionale

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THE ELECTRONICS INDUSTRY IN CANADA

— AN OVERVIEW —

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Introduction

The past decade has been one of profound change. Technological advances, spurred on by leaner, more competitive economies around the world, are starting to have a major impact on the industrial process. Computer-aided design and manufacture, robotics, office automation and advanced communications have brought about major increases in productivity in the industrialized countries. These productivity increases have been essential given rising energy costs and stiff price competition from the newly developed countries.

The pervasiveness of electronics in an increasing variety of end products indicates the rapid adoption of new technologies and the need for long-term development strategies for the electronics industry in Canada. Industry and government are working together toward this goal through a number of policies aimed at increased investment in Canada. The government is attempting to make the business climate more predictable for industry through long-term agreements with the major players, revised tax legislation and improved dialogue between the business community and government. This document represents a small introductory step in this process and provides details about the electronics industry in Canada, its subsectors, and the environment in which it operates.

General Profile

The purpose of this industry overview is to provide prospective investors with a glimpse at the wealth of opportunities that exist within one of the fastest growing sectors of the Canadian economy. More than any other sector, the electronics industry is creating change, not only in the types of goods and services Canadians buy, but also in the environment in which they work and live. Office and factory automation, advanced telecommunications and computer-aided design and manufacturing have brought about necessary changes in productivity to keep Canadian industry competitive on a worldwide basis. These advances have been readily integrated into the business environment, establishing the electronics industry as one of the growth industries of the 1980s.

Growth has been the watchword of all sectors comprising this industry. Over the past decade the industry, as a whole, has seen product shipments increase by over 150 per cent, the domestic market by 200 per cent and exports by 600 per cent. Even though demand slackened somewhat during the recent worldwide recession, the industry rebounded with vigor in 1984 claiming a 15 per cent increase in shipments, a 25 per cent increase in domestic market and a 40 per cent increase in exports. There is every indication that this trend will continue through the 1980s and into the 1990s.

Comprising more than 1 800 companies, this sector seeks to satisfy a domestic demand now close to $14 billion. Although not large by international standards, the Canadian electronics industry has shown itself to be dynamic and competitive in world markets, exporting over $5 billion worth of products in 1984.

Through geographical necessity, Canada has developed a telecommunications technology recognized around the world for its innovation and excellence. With products such as digital central office switches and data multiplexers, telecommunication satellites and fibre optics, this subsector, dominated by domestic firms, provides one of the leading edges in the Canadian electronics industry.

The Canadian Electronics Industry
(Millions $Cdn)

Year	Shipments	Total Exports	Imports	Apparent Domestic Market	Direct Employment
1974	3 007	749	2 168	4 426	96 975
1980	5 620	2 481	5 449	8 588	93 844
1984	7 948	5 168	11 104	13 884	96 403

Source: Electronics Directorate (includes all subsectors)

Other subsectors, such as consumer electronics, household appliances, computer and office equipment, instruments, components and defence electronics, are dominated by subsidiaries, primarily of American multinationals. In other areas, development and manufacturing of such diverse products as geophysical instruments, flight simulators, word processors and software packages have guaranteed that Canadian technology will continue to have a reputation for excellence in the world high technology marketplace.

Location and Concentration

The rapid growth of the electronics industry in Canada has been facilitated by the development of industrial infrastructures in several areas of the country. Abundant, low-cost energy; ample office and manufacturing space; high-quality educational and research centres; a competitive, well-trained labour force; clean cities with excellent cultural and outdoor recreation facilities — these are all factors that, by a combination of ambitious planning and happenstance, have led to the development of high-tech communities in most major Canadian cities.

In the Atlantic provinces, ongoing research is centred on the challenge of harvesting and managing the natural resources located along the continental shelf. Electronics firms in this region are involved in the development of the sophisticated instrumentation, equipment and business services that the resource managing industries require to accomplish this task, not only in traditional areas such as the fisheries but also in the rapidly developing petroleum industry.

The Canadian Electronics Industry
Geographic Distribution (1982)

Region	Number of Establishments	Shipments (Thousands $ Cdn)
Atlantic	13	24 531
Quebec	182	1 335 638
Ontario	551	4 364 258
Prairies	88	132 579
B.C.	73	95 599
Not specified	—	792 524
TOTAL	906	6 745 129

Source: Electronics Directorate (includes all subsectors)

In central Canada, electronics firms from all sectors of the industry provide the research and development, products and services essential to keep the industrial manufacturing heartland of the country competitive in world markets. Advanced telecommunications, factory and office automation, CAD/CAM, artificial intelligence applications and software development are all areas of research and expertise that are helping to keep industry competitive.

The electronics firms in the Prairies have developed in response to three areas critical to this region: communications, resource development and agriculture. Research and development in all three is being done by a myriad of small, highly specialized firms in the Winnipeg, Saskatoon, Calgary and Edmonton areas.

On the western coast of Canada, the electronics firms of British Columbia, mostly located in the Vancouver area, are involved primarily in telecommunications with ongoing research in the areas of mining and forestry applications and oceanography.

The Canadian Electronics Industry
Concentration (1982)

Firm Size Average Number Employed	Total Employees	Production Employees	Shipments (Thousands $ Cdn)
0 - 19	2 816	1 624*	158 163
20 - 199	21 983	12 682*	1 270 875
200 & over	72 230	41 666*	5 316 091
TOTAL	97 029	55 972	6 745 129

*Estimates

Source: Electronics Directorate (includes all subsectors)

Government Activity

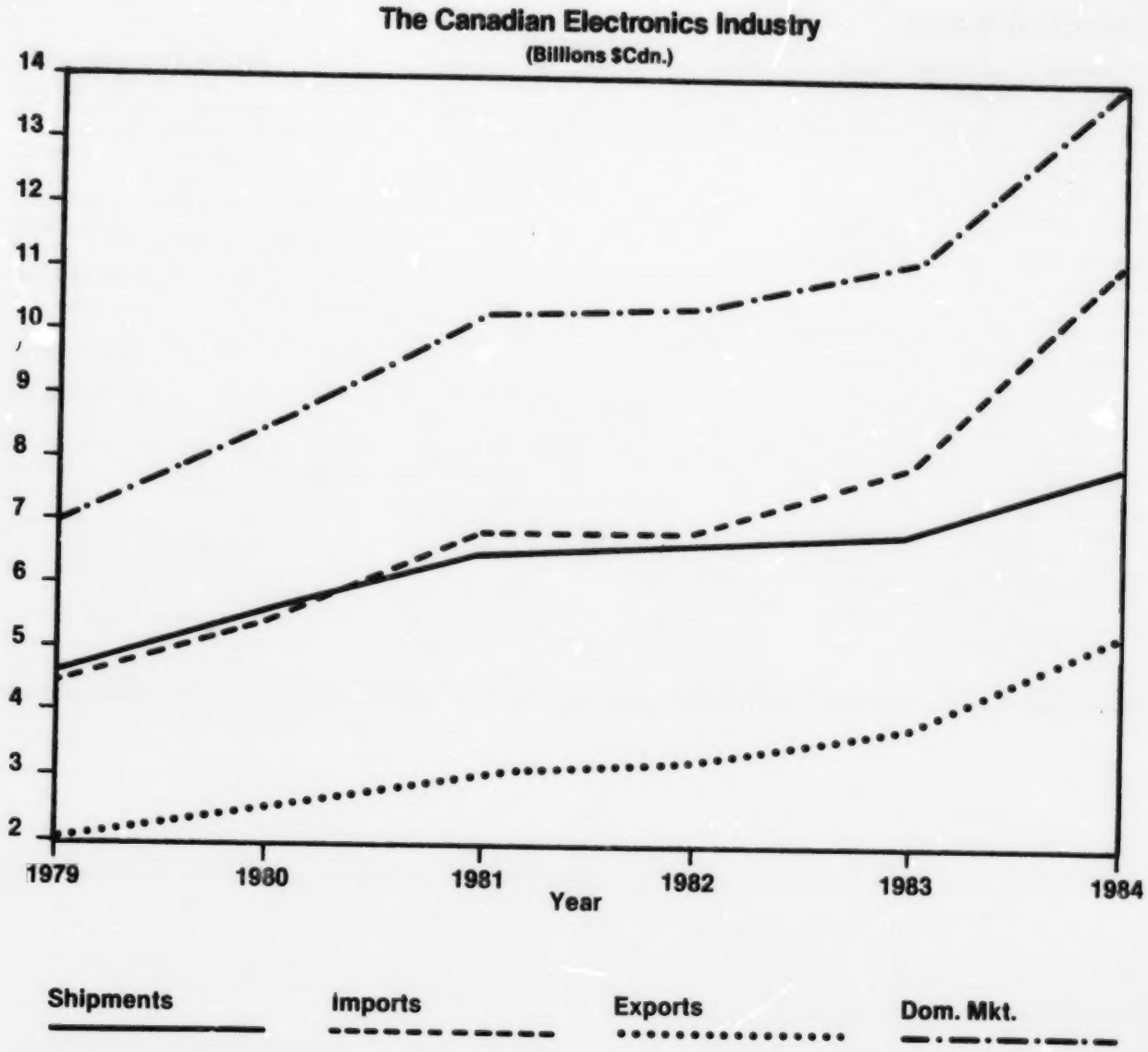
Companies in all regions have benefitted from the commitment on the part of all levels of government to the expansion and development of the electronics industry. Government-sponsored research facilities are located in all provinces ranging from the National Research Council laboratories to microelectronics research centres, proposed or in place, in all provinces as well as CAD/CAM research facilities in selected areas. In addition, the federal government has provided appropriate tax incentives for research and development, funding for university and private sector research and federal procurement incentive policies in areas permitted by international treaty.

Electronics firms are considered attractive additions to the industrial community of any developing urban area. All levels of government — federal, provincial and municipal — are taking active roles in encouraging these firms to invest in Canada. Canada is open for business and the government's role is to provide the best information possible, facilitate and encourage development, and provide incentives for manufacturing, research and development.

Competitive Advantages

In general, the Canadian electronics industry has proved to be extremely competitive in world markets. Energy and basic inputs are abundant and among the lowest in price in the world. Labour is well trained, available and less expensive than in most areas of the United States. A considerable commitment to basic research in this country has resulted in a variety of research facilities and services on a nation-wide basis. Canadian enterprises have proved to be extremely cost-competitive with most firms in the United States and the labour record is good. Fewer than 0.2 per cent of total person-days have been lost due to work stoppages for the whole industry over the last five years.

In terms of international competitiveness, Canadian telecom firms have shown themselves to be world leaders with products such as data and voice switches and satellite communications technology. In other sectors where foreign-owned multinationals tend to dominate the market, the subsidiaries have demonstrated the capacity to innovate and compete in world markets with products developed in Canada. Canada has encouraged these firms to compete for product mandates and, for many, the rewards have been significant. For a number of reasons, domestic demand has outstripped domestic supply and several sectors show a high degree of import penetration; the mass market is being supplied from offshore sources while small Canadian firms seek highly specialized product niches.


The Canadian Electronics Industry
(Billions $Cdn.)
14
13
12
11
10
9
8
7
6
5
4
3
2
1979
1980
1981
1982
1983
1984
Year
Shipments
Imports
Exports
Dom. Mkt.

Sector Profiles

Consumer Electronic and Electrical Products

The consumer electronic and electrical products sector comprises major and small appliances and radios and televisions. The products within this diverse grouping include: audio and video recorders, radios and televisions, television converters, stereo equipment, air-conditioners and kitchen appliances such as microwave ovens, dishwashers, stoves, freezers, refrigerators, washers, dryers, as well as electric kettles and blenders.

In 1984, approximately 20 per cent of all shipments were accounted for by small appliances, 50 per cent by major appliances and 30 per cent by radios and TVs. The sector, as a whole, shipped over $1.8 billion and exported slightly more than $400 million worth of goods. Radios and televisions accounted for over half of the $2.2 billion imported in this sector. This is the result of substantial consumer demand for such products as VCRs, colour TVs and stereo equipment which is being satisfied by imports from Pacific Rim countries.

The domestic appliance market is dominated by Canadian subsidiaries of foreign multinationals, many of which are branch-plant operations primarily satisfying a Canadian market. Still, domestic demand in this sector has more than doubled over the last 10 years and, despite the substantial trade deficit, exports have grown by 260 per cent during the same period.

The consumer electronic and electrical products industry employs 15 000 people, of whom some 9 000 are directly involved in manufacturing. In 1984 salaried employees earned an average of $15.50 per hour while non-salaried employees earned an average of $9.50 per hour.

Like all sectors of the electronics industry, consumer electronic and electrical products firms have been relatively strike-free over the last six years, losing only one-half of one per cent of total person-days to work stoppages.

By subsector, some of the largest manufacturers in Canada are:

Major Appliances

Camco Inc.
General Freezer Ltd.
Inglis Ltd.
Keeprite Inc.
W.C.I. Canada Ltd.
W.C. Wood Co. Ltd.

Small Appliances

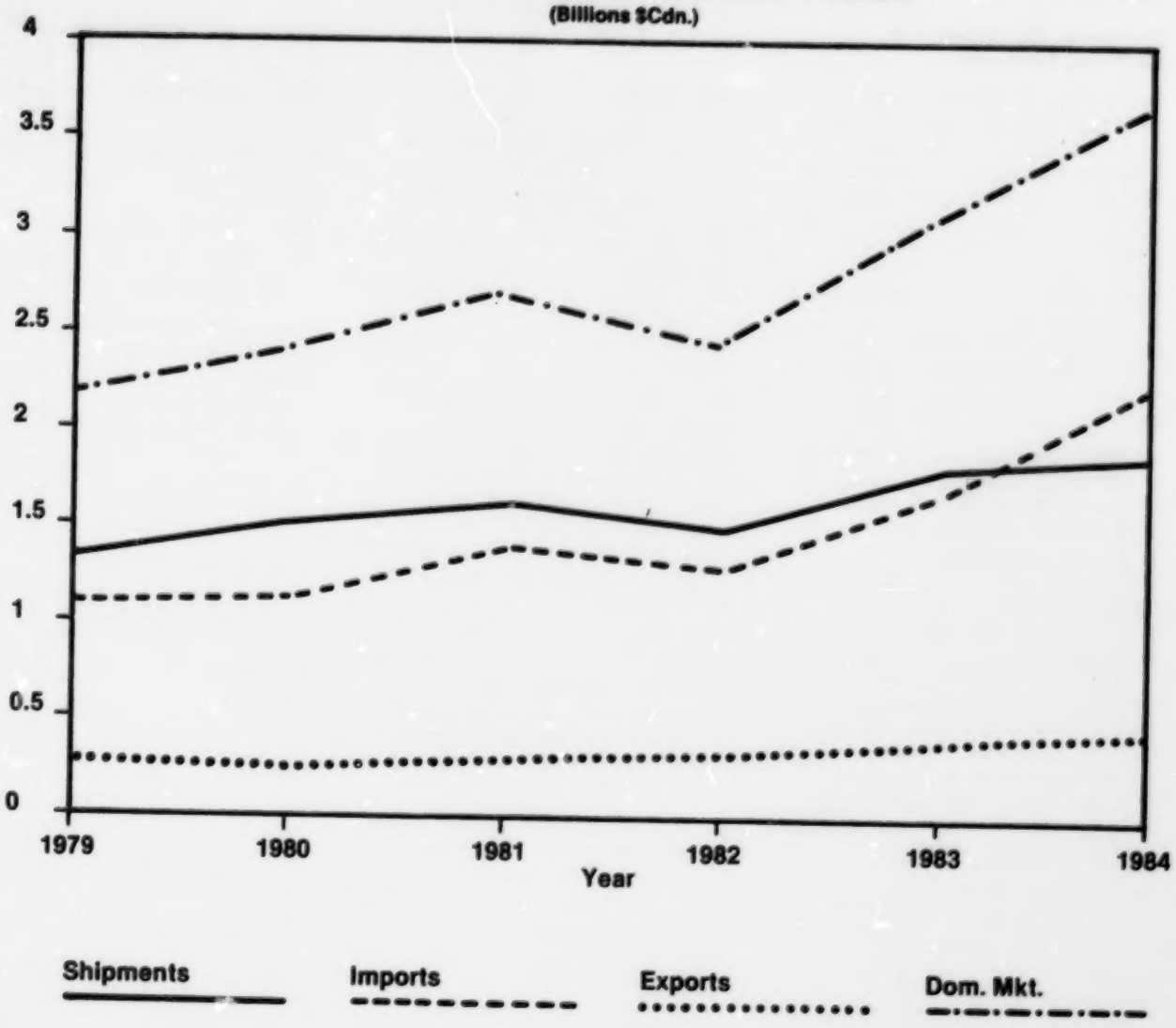
Black and Decker Canada Inc.
Creative Appliances Ltd.
Hoover Company Ltd.
Iona Appliances Inc.
Sunbeam Corp. (Canada) Ltd.
T.R.E. Inc.
Toastess Inc.
Wesston Appliances
Westbend of Canada Ltd.

Radios and Televisions

Electrohome
General Instrument
Hitachi
Matsushita
Mitsubishi
Philco
R.C.A.
Sanyo

Consumer Electronic and Electrical Products

(Billions $Cdn.)



Communications Equipment

The communications sector consists of companies that manufacture transmission equipment for voice, data or video information. The major products are: radio transmission equipment, multiplex equipment, central office and subscriber switches, cable — both copper conductor and fibre optic — and subscriber apparatus. The sector has benefitted from a protected environment that has created market stability, a high degree of vertical integration and relative certainty with regard to future product requirements. The larger domestic firms have developed in accordance with their roles as suppliers to the main carriers while smaller firms supply specific product markets. This sector tends to be R&D-intensive with average annual growth rates in R&D expenditures of between 25 per cent and 30 per cent. The most recent data indicate that R&D expenditures have reached well above $600 million per year. This represents more than double current capital expenditures and averages 11 per cent of annual sales. The payoff has been a domestic communications industry competitive internationally, in terms of application of microelectronics techniques, and with the edge in digital and packet switching.

The communications sector represents one of the largest and fastest growing segments of the Canadian electronics industry. The more than $2.75 billion in shipments represent 35 per cent of all products shipped in the electronics industry and the growth rate is 18 per cent per year. The apparent domestic market is $1.8 billion and is growing at a rate of 8 per cent each year. Total exports are currently $1.7 billion and growing at 45 per cent per year, giving this sector the only trade surplus in the overall industry. High volumes and rapid growth are the result of a substantial commitment of both public and private resources to ongoing research and development.

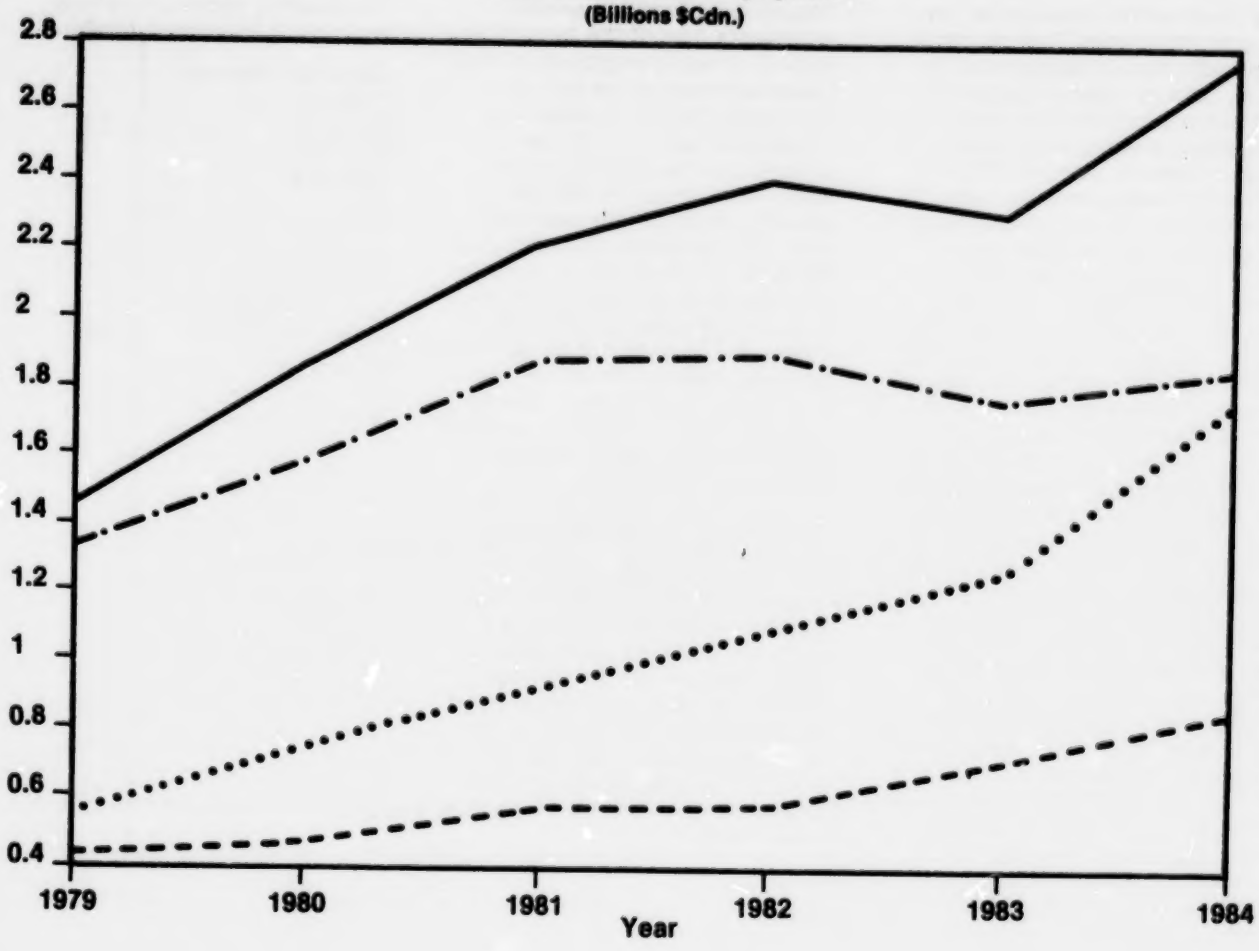
The communications sector employs 38 000 people of whom 23 500 are employed directly in manufacturing. In 1984, salaried employees earned an average $16.50 per hour and non-salaried employees $11.20 per hour. In this sector fewer than 0.3 per cent of total person-days have been lost due to work stoppages since 1979.

The leading communications equipment manufacturers are:

Canadian Marconi
Develcon
Farinon
Gandalf
Glenayre
MDI
Microtel
Mitel
Motorola
Northern Telecom
Spar
SR Telecom
TIE
Tran

Communications Equipment

(Billions $Cdn.)



Shipments ——— Imports - - - - - - Exports ..... Dom. Mkt. —·—·—·—

Components

The components sector is composed of a captive subsector — large communications and computer companies that produce components for in-house use, and a merchant subsector — smaller firms that produce commodity items or satisfy niche markets that are uneconomic for large suppliers. Products include printed circuit boards, microelectronics components, satellite parts and components, earth station components, semiconductors, transformers, passive components and connectors.

The component manufacturers shipped $760 million in 1984, growing at an average annual rate of 20 per cent. The domestic market is well over $2 billion and increasing at 15 per cent each year while exports stand at $1 billion, an increase of 75 per cent over the previous year.

This sector employs 10 300 people with an estimated 6 500 involved in manufacturing. In 1984 salaried employees were paid an average $16.50 per hour while non-salaried employees earned $11.20 per hour. Over the last six years there have been relatively few reported strikes in this sector so that only 0.24 per cent of total person-days were lost due to work stoppages.

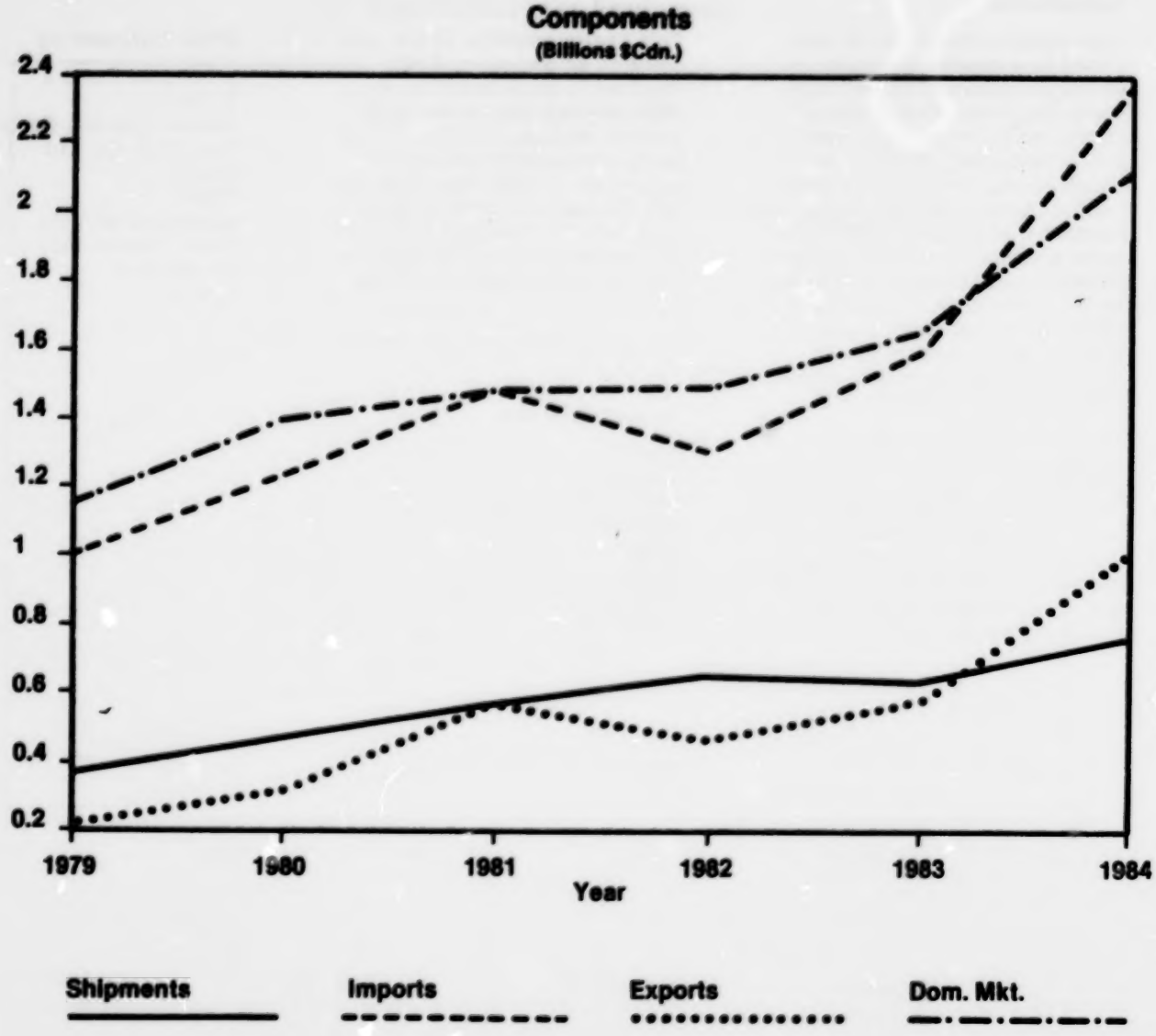
The major manufacturers in this sector are:

Semi-Conductors

Epitek
Garrett
Linear Technology
Microtel
Mitel
Mosaid
Silonex
Siltronics

Other Components

Amphenol Canada
C.T.S.
Cannon Electric Canada
Circocraft Co. Ltd.
Croven
EDAC
Hammond Mfg. Co. Ltd.
Helix Circuits Inc.
Murata Erie
Tectrol


Components
(Billions $Cdn.)
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
1979
1980
1981
1982
1983
1984
Year
Shipments
Imports
Exports
Dom. Mkt.

Computer and Office Equipment

The computer and office equipment sector is composed of firms primarily engaged in the manufacture of computers and business equipment including peripherals and parts, office equipment including typewriters, word processors and photocopiers and store machinery including cash registers and scales. The sector is dominated by several subsidiaries of large, mainly American, multinationals comprising close to 85 per cent of the market. The rest of the firms in this market are small, domestic and niche-oriented, satisfying specific product areas. Some of these specialized areas include word processors, packaged software, microcomputers, graphics terminals and minicomputers.

The domestic market is $4.6 billion and has been growing at 30 per cent per year. To be competitive on a world scale, domestic manufacturers have become highly export-oriented and now export $1.8 billion, a figure which is growing at 20 per cent per year.

The high domestic demand for the latest technology has created a market which Canadian sources have been unable to supply and the trade deficit in this sector now stands at $3 billion — an opportunity for significant import substitution.

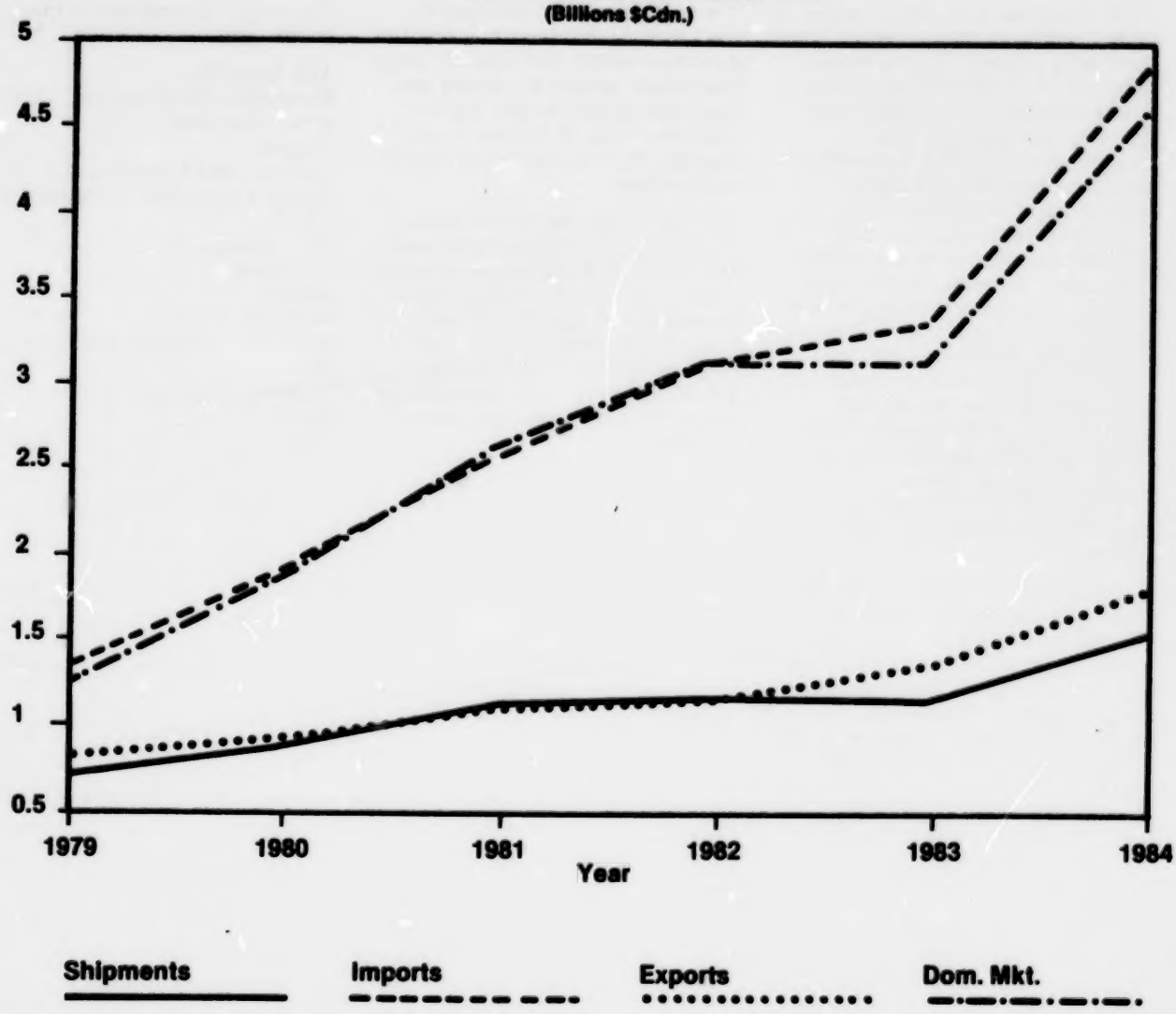
The computer and office equipment sector employs 14 500 workers of whom 6 450 are involved in production. Salaried employees earned an average $14.75 per hour in 1984 and non-salaried employees earned an average $10.70 per hour. Over the last six years no work stoppages were reported.

The major companies in the sector are:

AES Data Inc.
Burroughs Memorex Inc.
Bytec Comterm
Cognos
Control Data Canada Ltd.
Digital Equipment of Canada Ltd.
GEAC
IBM Canada Ltd
I.P. Sharp
Matrox
NCR Canada Ltd.
Philips Information Systems Ltd.
Remanco
Waterloo Systems
Xerox

Computer and Office Equipment

(Billions $Cdn.)



Instrumentation and Industrial Process Control Systems

This sector is made up of several subsidiaries of large American corporations, performing systems integration, and 250 smaller companies, many with sales of less than $1 million per year, satisfying specific commodity markets. These companies supply a broad range of products in computer-based control, automation, monitoring and supervisory systems used in primary and secondary industry applications. The sector has demonstrated a particular expertise in the development of instruments for geophysical exploration, pollution control and detection, and energy management.

This sector has a domestic market of over $1.6 billion which continues to grow at about 8 per cent each year. The export orientation of the smaller companies, many of which export up to 90 per cent of their production, has helped increase exports in this sector by 15 per cent to $204 million over the past year.

The global recession of the early 1980s had an impact on this industry, stalling domestic production at about $1.2 billion, because of its role as a supplier of instruments to primary and secondary industries.

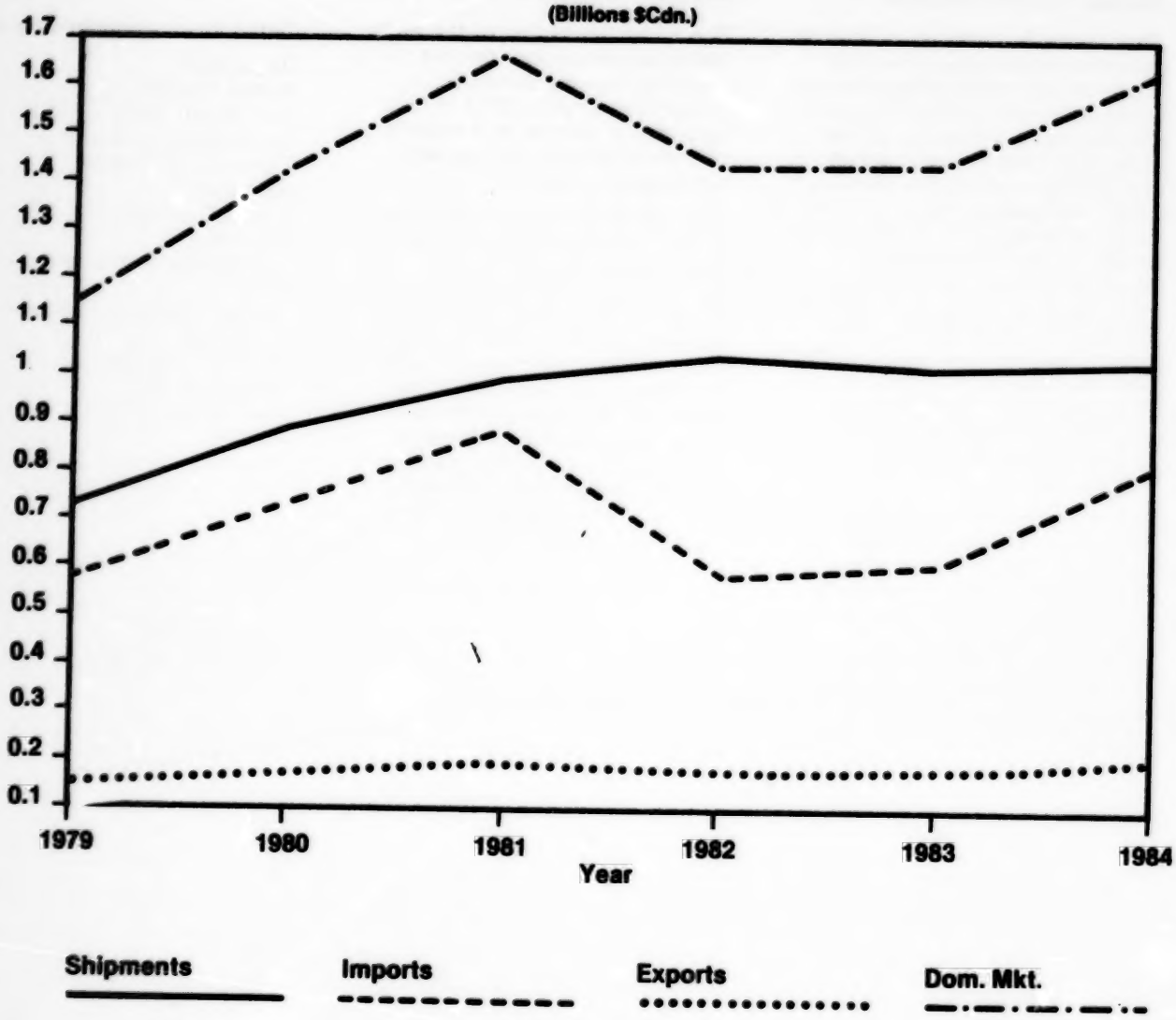
Over 19 000 people are employed in the instrumentation and industrial process control systems sector. Approximately 8 300 are employed directly in manufacturing and a further 1 900 in R&D. The average 1984 wage for salaried employees was $14.00 per hour in 1984 whereas non-salaried employees earned an average $9.90 per hour. About 0.1 per cent of total person-days were lost due to work stoppages in the 1979–1985 period.

Some major companies are:

Accugraph
Bailey Controls
CAE Electronics
Documented Circuits
Edwards of Canada
Epic Data
Fisher Controls
Foxboro
Foundation Instruments
G.E.C.
General Systems Research
Honeywell Controls
Johnson Controls
Lumonics
Robertshaw Controls
Sentrol

Instrumentation

(Billions $Cdn.)



Opportunities for the Future

The electronics industry in Canada covers a wide area encompassing most major fields of high technology. Canadian companies, both foreign-owned and domestic, have demonstrated that they possess the capabilities to compete in world markets, developing and manufacturing state-of-the-art products.

For those interested in supplying the North American market, locating manufacturing operations in Canada can offer a number of distinct advantages. The labour force is well educated and capable while labour rates are very competitive with the United States and productivity is as good, or higher. There is an ample supply of serviced land in industrial parks surrounding the urban centres, as well as downtown office space at reasonable cost. Canada's abundant supply of natural resources and hydroelectric power guarantee inexpensive primary inputs and energy. An established industrial infrastructure provides the electronics sector with a broad range of services and suppliers at competitive prices. Canada has excellent trading relations with the U.S. Canada is both the largest importer and exporter to the U.S.; an increasing number of products now cross the border free of any tariff. Clearly, Canada's competitive advantages make it an attractive alternative for manufacturers seeking access to North American markets.

There are significant opportunities in the electronics industry. There is a high degree of import penetration in most sectors. Manufacturers of consumer electronics products, such as TVs, VCRs and compact disc players, for example, would find the Canadian market an attractive place in which to grow. The potential for import substitution is also high in computers and office equipment, where 75 per cent of all products are imported, and components, where 90 per cent of all general-purpose components are imported.

The Canadian electronics industry is dynamic. Canada's close links to the rapid technological developments in North America have guaranteed growth over the last 10 years. The ability to respond quickly to changes in the marketplace and to develop innovative, state-of-the-art products has become a recognized quality of Canadian-based electronics manufacturers. New arrivals on the Canadian scene find this combination of entrepreneurial drive and technological competence to be a compelling factor in their decision to locate in Canada. In addition, the Canadian government has made a commitment to assist in the further growth and development of this key industry and has provided substantial support through tax incentives and funding programs.

New opportunities have opened up in the areas of defence electronics and aerospace. Major Crown projects have been announced that will benefit prospective suppliers as Canada increases its commitment to NATO and North American defence. As a result of government agreement, Canadian-based firms have preferred status as suppliers to the American defence market so that locating in Canada not only benefits future suppliers to the Canadian government but also those seeking to supply the American military. The Canadian government also makes research and program support available to meet project commitments for both Canadian and American requirements.

For more detailed information on any aspect of the electronics industry in Canada, contact:

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